



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/818,688	03/26/2001	Youfeng Wu	042390.P10788	9953

7590 10/06/2003

Sanjeet K. Dutta  
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP  
Seventh Floor  
12400 Wilshire Boulevard  
Los Angeles, CA 90025-1026

EXAMINER

VO, TED T

ART UNIT	PAPER NUMBER
----------	--------------

2122

DATE MAILED: 10/06/2003

7

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**Application No. **09/818,688**Applicant(s) **WU, YOUFENG**

Examiner

Ted T. Vo

Art Unit

2122

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 March 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4,5,6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

1. This action is in response to the application filed on 3/26/2001.

Claims 1-27 are original claims.

Claims 1-27 are pending in the application.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 10-16, 19-25 are rejected under 35 U.S.C. 102(b) as being anticipated by Wu et al., "An Efficient Software-Hardware Collaborative Profiling Technique for Wide-Issue Processors", October 1999.

Given the broadest reasonable interpretation of followed claims in light of the specification.

As per claim 1:

Wu discloses, "**A method, comprising: using hardware and software** (page 2, second paragraph, 'powerful compiler analysis to insert minimal profiling instruction, and hardware that asynchronously execute profiling operations in free slots available in user program execution') **to perform continuous edge profiling on a program;** (page 2, see branch instruction in first bullet, 'call a profiled block with a branch instruction'); **detecting profile phase transitions continuously;** (page 2, see profile counters in second bullet, 'branch-id instructions' and 'update operations to manipulate profile counters'); **and**

Art Unit: 2122

***optimizing the program based upon the profile phase transitions and edge profile*** (see page 1, first paragraph of section 1 Introduction, 'runtime profiling and optimization')"

As per claim 2: Wu discloses, "*The method of claim 1, wherein using hardware and software comprises: using software to insert edge profiling instructions and arrange profile data* (see page 6, second paragraph, '...to each of the branch blocks...'); *executing the program; and using hardware to update profile, and signal phase transitions*" (see page 6, section 4.2, Profiling hardware, 'At runtime...').

As per claim 3: Wu discloses, "*The method of claim 2, wherein using software to insert profiling instructions comprises modifying branch instructions to assign an identifier to one or more profiled edges, and to assign a value to an edge selection field*" (see page 6, section 4.1.3).

As per claim 4: Wu discloses, "*The method of claim 3, wherein using software to insert profiling instructions further comprises inserting a profile identifier instruction when the profiled edge does not have a branch instruction; (see page 6, second paragraph, '...to each of non branch blocks...') an initialize profile instruction; and a set offset instruction*" (see page 4, section 3, Profiling instruction and Registers).

As per claim 5: Wu discloses, "*The method of claim 2, wherein using hardware comprises translating edge profiling instructions into profile update operations*" (see page 6, last paragraph, 'three update operations').

As per claim 6: Wu discloses, "*The method of claim 4, further comprising: loading a profile information register with a base address, an offset value, a trigger-counter, and a flag*" (see page 7, Figure 3).

As per claim 7: Wu discloses, "*The method of claim 5, further comprising: intercepting with hardware the profiling instructions; generating a profile update operation; and updating profile counters*" (see page 2, second bullet, 'update operation to manipulate profile operation').

As per claims 10, 19: The claims have the functionality corresponding to the claim 1. Claims 10, 19 are rejected in the same reason set forth in connecting to the rejection of claim 1.

As per claims 11, 20: The claims have the functionality corresponding to the claim 2. Claims 11, 20 are rejected in the same reason set forth in connecting to the rejection of claim 2.

Art Unit: 2122

As per claims 12, 21: The claims have the functionality corresponding to the claim 3. Claims 12, 21 are rejected in the same reason set forth in connecting to the rejection of claim 3.

As per claims 13, 22: The claims have the functionality corresponding to the claim 4. Claims 13, 22 are rejected in the same reason set forth in connecting to the rejection of claim 4.

As per claims 14, 23: The claims have the functionality corresponding to the claim 5. Claims 14, 23 are rejected in the same reason set forth in connecting to the rejection of claim 5.

As per claims 15, 24: The claims have the functionality corresponding to the claim 6. Claims 15, 24 are rejected in the same reason set forth in connecting to the rejection of claim 6.

As per claims 16, 25: The claims have the functionality corresponding to the claim 7. Claims 16, 25 are rejected in the same reason set forth in connecting to the rejection of claim 7.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

A person shall be entitled to a patent unless –

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 8-9, 17-18, 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wu, in view of Conte et al., "Using Branch Handling Hardware to Support Profile-Driven Optimization", ACM, 1994.

As per claim 8: Regarding limitation, "*The method of claim 1, wherein detecting profile phase transitions continuously, comprises generating an interrupt signal by the hardware when the profile phase transition*

Art Unit: 2122

*occurs*", Wu discloses a detection of profile phase transitions continuously using a special status register (see page 4.), which is modified by software.

Wu does not disclose, *"generating an interrupt signal by the hardware when the profile phase transition occurs"*.

Conte discloses a transition of profiling that uses a counter to update a branch target in a program (see Conte: page 13, section 2,1). Conte discloses Threshold that affects error in the executed branches. Conte discusses exception (interrupt) that handles the error (see page 18, section 4.1; particularly see 'Exceptions' in first paragraph of second column).

Exception is known in the art for handling error caused by interrupt signal in hardware or error of executions.

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention was made to modify status register which is used to handle profile branching of Wu from the teaching of Error handling shown by Conte in branch profiling for handling counter overflow. Doing so would detect the count of a counter accurately and prevent an error that might be caused by a running program.

As per claim 9: Regarding claim limitation, *"The method of claim 8, further comprising: determining if a program edge is hot, comprising determining if the profiling instruction is executed, and updating profiling counters associated with the profiling instruction; determining if a cold edge becomes a hot edge, comprising incrementing and decrementing trigger counters, and detecting if trigger counters overflow and underflow; preventing a false phase transition by detecting trigger counters underflow"*, Wu discloses a profile location in hardware for updating counter address (Wu: see page 6, section 4.2, 'address = "pir.base\_address+pir.offset +ID-1", and 'r') to update branch profiling.

Wu does not disclose a detection of a counter phase that causes a false phase.

In further view of Conte, it discloses "Threshold" to measure a transition in branch profiling used by a counter (Conte: see section 4.1, and 4.2; particularly, see "Threshold" in page 18, second column, first paragraph, and see "accurate" and "count saturate" in page 19, section 4.2). Threshold set in a profiling counter is known for preventing an excessive number of counting due to the overflow/underflow counting.

Art Unit: 2122

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention was made to include "*detecting if trigger counters overflow and underflow; preventing a false phase transition by detecting trigger counters underflow*", as set up Threshold values in the teaching of Conte, to the teaching updating counter address of Wu. Doing so would detect the count of a counter accurately and prevent a false indication of counter.

As per claims 17, 26: The claims have the functionality corresponding to the claim 8. Claims 17, 26 are rejected in the same reason set forth in connecting to the rejection of claim 8.

As per claims 18, 27: The claims have the functionality corresponding to the claim 9. Claims 18, 27 are rejected in the same reason set forth in connecting to the rejection of claim 9.

#### **Conclusion**

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted T. Vo whose telephone number is (703) 308-9049. The examiner can normally be reached on Monday-Friday from 8:00 AM to 5:30 PM ET. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Dam, can be reached on (703) 305-4552.

The fax phone numbers for this Group are:


Official: (703) 746-7239;

After Final: (703) 746-7238;

Non-Official: (703) 746-7240.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

TTV  
September 29, 2003



**TUAN DAM**  
SUPERVISORY PATENT EXAMINER